

VCE Psychology

SCHOOL-ASSESSED COURSEWORK

Introduction

Outcome 1

Explain the relationship between the brain, states of consciousness including sleep, and behaviour, and describe the contribution of selected studies and brain research methods to the investigation of brain function.

Task

Test: multiple choice, short answer and extended response.

This task will be marked out of 55 and converted to a score out of 25.

If this is a **Pair B** task it will contribute 50% of the marks (50) allocated for Outcome 1.

If it is a **Pair A** task it will contribute 40% of the marks (50) for this outcome.

A second task will be completed for this outcome.

The task has been designed to allow achievement up to and including the highest level in the Performance Descriptors.

You have 75 minutes in which to complete this task. NO access to notes or texts.

Your teacher will advise you of any variations to these conditions.

Answer in the space provided or as directed.

This task covers a broad range of **key knowledge** and **key skills** across Area of Study 1.

NAME:

Task

Section 1: Multiple Choice Questions (25 marks):

Circle the correct response. If you wish to change your answer, place a neat X through the one you circled and circle your preferred alternative.

Question 1

In terms of human consciousness, Descartes' theory of 'dualism' referred to the notion that

- A. the mind and body are not separate but the mind controls the body
- B. the mind and body are separate and the mind controls the body
- C. the mind and body are not separate and they could affect each other
- D. the mind and body are separate and they could affect each other.

Question 2

William James described consciousness as being like a stream. This is because

- A. conscious thoughts often wander like a meandering stream
- B. streams provide a means of reflection just as our consciousness does
- C. the flow of conscious thoughts is changing continuously and moving past like a stream
- D. conscious thought may be clean or polluted like a stream.

Question 3

Ashleigh is attending a mid-year Psychology exam revision lecture. During the lecture, she has thoughts about the demands of her part-time job, the party she is attending tonight and the study she needs to do for her Learners Permit test next week.

What is the best way of describing her state of consciousness?

- A. normal waking consciousness
- B. altered state of consciousness
- C. focused state of consciousness
- D. selective state of consciousness.

Question 4

Dylan is in the middle of unloading the dishwasher when his mobile phone rings. He answers it, switches it to 'speaker' and finishes unloading the dishwasher while talking to his friend at the same time.

For Dylan, unloading the dishwasher can be considered

- A. an automatic process; because it involved alert awareness and mental effort
- B. an automatic process; because it was completed with minimal awareness and did not interfere with the other task
- C. a controlled process; because it was completed with minimal awareness and did not interfere with the other task
- D. a controlled process; because it involved alert awareness and mental effort.

Question 5

The restorative theory of sleep proposes that sleep

- A. protects the organism from predators
- B. enables the organism's damaged cells to be repaired
- C. allows the organism to conserve energy
- D. occurs at particular times in an organism that are programmed by the reticular activating system.

Task

Question 6

During a typical night's sleep

- A. periods of NREM sleep occur more often as the night progresses
- B. periods of REM sleep occur less often as the night progresses
- C. periods of NREM sleep increase in length as the night progresses
- D. periods of REM sleep increase in length as the night progresses.

Question 7

A researcher investigating alterations in physiological arousal with heightened levels of alertness in normal waking consciousness is measuring changes in electrical activity in the brain.

He is **most likely** using a device called an

- A. electroencephalograph
- B. electro-oculargraph
- C. electrocardiograph
- D. electromyograph.

Question 8

Self-reports such as _____ and _____ are often used in sleep studies.

- A. video monitoring; electroencephalographs
- B. electroencephalographs; sleep diaries
- C. sleep diaries; questionnaires
- D. questionnaires ; video monitoring.

Question 9

Studies of people suffering from sleep deprivation indicate that changes in their ability to function in normal waking consciousness *begin* to occur after about _____ days, and usually involve the inability to complete _____ tasks.

- A. three; simple
- B. ten; complex
- C. ten; simple
- D. three; complex.

Question 10

Patients in a sleep laboratory were woken every time they lapsed into REM sleep for the duration of a night. The following night they were allowed to sleep completely uninterrupted.

The sleep laboratory technicians would have noticed that on the second night patients

- A. were unable to enter REM sleep
- B. spent more time than usual in REM sleep
- C. spent the entire night in REM sleep
- D. spent the same amount of time in REM sleep as they would normally.

Question 11

One of the reasons adolescents (people aged 13–19 years old) have sleep difficulties is biological in nature and involves _____.

- A. their increasing desire to socialise
- B. increasing demands on their time
- C. a delayed release of melatonin
- D. an earlier release of melatonin.

Task**Question 12**

The somatic nervous system controls _____.

- A. body temperature
- B. blood pressure
- C. problem solving
- D. skeletal muscles.

Question 13

Which of the following is found in the parietal lobe?

- A. the motor cortex
- B. the somatosensory cortex
- C. the olfactory bulb
- D. short term memory.

Question 14

Yun is looking directly at a projection screen. Her right eye is covered with a patch and an image of a cake is flashed in the middle of the screen.

In which hemisphere of the brain would the visual information be registered?

- A. right hemisphere
- B. left hemisphere
- C. no hemisphere
- D. both right & left hemispheres.

Question 15

The *reticular activating system* extends through the middle of the brainstem. It allows the passage of neural information to travel up to cortical areas and down to the spinal cord. The structure that sits on top of the brainstem and serves as a gateway to filter information from all the major senses is the

- A. medulla
- B. pons
- C. thalamus
- D. hippocampus

Question 16

Maneka sustained damage to her brain following a fall from her horse. Prior to the injury her speech was fluent and easily understood. Maneka now has difficulty producing speech, and she leaves out joining words such as 'to' and 'but'. She has most likely sustained damage to

- A. Wernicke's area.
- B. the sensory area.
- C. Broca's area.
- D. the temporal lobe.

Question 17

Spatial neglect is a condition in which people appear to be unaware of one side of their world. This is not so much a sensory problem as it is an inability to _____ the left side of their world due to damage of the right _____ lobe.

- A. attend to; parietal
- B. perceive; temporal
- C. perceive; parietal
- D. attend to; temporal.

Task

Question 18

Jason suffered a severe head injury in a diving accident when his head hit rocks in water he had assumed to be much deeper. MRI scans indicated damage near the front of the parietal lobe on the right side. The most probable consequence from this accident would be that Jason could no longer

- A. feel anything with his left foot
- B. construct meaningful sentences
- C. move his left foot
- D. construct fluent sentences.

Question 19

Change blindness involves the presence of a visual disruption during which detection of the change requires the comparison of one image to another. As the two images cannot be seen together, the comparison must be made in

- A. the somatosensory cortex
- B. the visual cortex
- C. short-term visual memory
- D. the temporal lobe.

Question 20

Synesthesia is a perceptual experience in which

- A. people hear voices that are not really there
- B. stimulation of one sense produces unusual experiences in another sense
- C. there is a significant reduction in the sensitivity of a particular sense
- D. there is a significant increase in the sensitivity of a particular sense.

Question 21

Transcranial magnetic stimulation involves

- A. direct stimulation of the brain using a small electric current administered via an electrode
- B. stimulation by enormous magnets that rotate around the head while the patient remains perfectly still, lying in a circular chamber
- C. uses hand-held magnets to depolarise the neurons in the brain and thereby generate a weak electric current that stimulates specific or general parts of the brain
- D. the injection of a harmless amount of radioactive material which is then traced by large magnets circulating the patient's head while they lay still in a large chamber.

Question 22

One limitation of using CT scans to study the brain is that

- A. the required exposure to X-rays is potentially harmful
- B. people with metal implants cannot undertake the procedure
- C. some people may have a negative reaction to the anaesthesia administered
- D. the procedure requires the ingestion or injection of a radioactive substance.

Question 23

Two procedures that allow researchers to view changes in brain activity over time are

- A. positron emission topography (PET) scan and computerised tomography (CT) scan
- B. positron emission topography (PET) scan and functional magnetic resonance imaging (fMRI) scan
- C. magnetic resonance imaging (MRI) scan and functional magnetic resonance imaging (fMRI) scan
- D. computerised tomography (CT) scan and magnetic resonance imaging (MRI) scan.

Task**Question 24**

When studying human sleep patterns, a researcher has the responsibility to

- A. ensure participant confidentiality
- B. debrief the participants at the start of the study
- C. withhold information from the participants about the nature of the study
- D. avoid short-term disruption of participant sleep patterns for the purpose of the study.

Question 25

Professor Slumber, a sleep researcher, conducts an experiment to test the effect of a herbal drug on reducing insomnia (sleep deprivation). His experiment uses an independent-groups design. Professor Slumber has his assistant, Miss de Meanour, conduct the experiment using a double-blind procedure. By using a double-blind procedure, Professor Slumber has ensured that

- A. only the control group participants knew whether they were receiving the placebo or the real drug
- B. only the experimental group participants knew whether they were receiving the placebo or the real drug
- C. Professor Slumber and Miss de Meanour knew who was receiving the placebo or the real drug
- D. only Professor Slumber knew who was receiving the placebo or the real drug.

25 x 1 = 25 marks

Task**Section 2: Short answer and Extended response (30 marks)****Question 1**

All types of sound stimuli are processed by the _____, located in the _____ lobe of the brain.

*2 marks***Question 2**

Vithiya had an operation during which her right and left cerebral hemispheres were separated to help control her epileptic seizures. Afterwards, Vithiya took part in an experiment where she was asked to look at a dot painted on the centre of a screen while a picture of an apple was projected onto the left side of the screen.

- i. What is the name of the structure that was cut to separate the two hemispheres?

1 mark

- ii. Explain *how* and *why* the operation affected Vithiya's response to the picture on the screen.

*3 marks***Question 3**

An Occupational Health and Safety Officer believes that air traffic controllers are significantly less alert near the end of a shift. He decides that they should have GSR and EEG readings taken. He believes that these will show whether the air traffic controllers are alert or sleepy.

- i. Explain what the GSR measures.

1 mark

- ii. How would the EEG be used to determine the air traffic controllers' state of alertness?

2 marks

Task

Question 4

In an effort to raise money for sleep research, Steve, a young disc jockey, gets sponsorship for attempting to stay on air continuously during the Queen’s Birthday long weekend. At the end of his 72-hour stint on the radio, Steve is suffering a number of effects from sleep deprivation.

- i. Identify two **psychological** and two **physiological** effects of prolonged sleep deprivation from which Steve may be suffering.

Psychological:

Physiological:

2 + 2 = 4 marks

Question 5

- i. What is the *reticular activating system* (RAS)?

1 mark

- ii. What is the main function of the RAS and how does this influence *selective attention*?

3 marks

Task

Question 6 (Extended Response)

Using relevant examples, describe how altered states of consciousness differ from normal waking consciousness in terms of changes to

- (i) perception and cognition – 5 marks
- (ii) time orientation – 2 marks
- (iii) emotional awareness – 3 marks
- (iv) self-control – 3 marks

[illegible]

Task

[illegible]

13 marks

Total marks: 55

Teacher Advice

General

As this task covers many dot points in the *key knowledge* section of the Study Design (see pages 23–24), students need to study material that covers the breadth of the outcome.

Teachers may wish to give students some sort of preparatory ‘practice test’ prior to this SAC in order to provide them with feedback on the extent of their knowledge and therefore allow them time to brush up on areas in which there are gaps in their knowledge.

In preparing for this task, students would be well advised to make summary notes as they proceed through the material and to make a list of points with which they are experiencing difficulty. They can then spend more time going back over these items or consulting with their teacher for clarification of concepts that have not been well understood. It is also a prudent strategy for students to develop a glossary of new terms as they work through the content of this area of study. Definitions or descriptions of psychological terms are often required in exams and tests and a response that has been written in the student’s own language will be understood better than one copied from the text.

Students may wish to look at this section on past exam papers but they need to be mindful that the Study Design was changed for the start of 2011 and some of the material from old papers will not include new material. Likewise, past papers may include material that is no longer examinable.

The following table indicates the relationship between the highest level of the Performance Descriptor and the questions in this QAT.

Aspect of Highest Performance Descriptor	Question/s
Comprehensive and accurate explanation of the role of the brain in relation to states of consciousness and behaviour.	MC 1–15 SA 1, 2, 4, 5, 6
Accurate and coherent description of how brain research methods are used to investigate brain function.	MC 16–20
Accurate and thorough description of how selected studies have contributed to an understanding of brain function.	MC 21–23
Advanced skills in scientific investigation and inquiry.	All
Comprehensive and insightful application and communication of psychological information and understandings.	All

Note: This is one of two tasks for this outcome.

Solution Pathway

Below are suggested responses. Teachers should consider the merits of alternative responses.

Please note that the relevant dot point (DP) and/or sub-point for every question is acknowledged alongside the question number in the solutions below. This gives you the assurance that there has been a comprehensive coverage of all the *Key Knowledge* content embraced by this outcome.

Section 1: Multiple choice

Question 1 (DP1): D

Question 2 (DP10): C

Question 3 (DP2): A

Question 4 (DP2): B

Question 5 (DP3): B

Question 6 (DP3): D

Question 7 (DP4(i)): A

Question 8 (DP4(ii)): C

Question 9 (DP5(i)) : A

Question 10 (DP5(ii)): B

Question 11 (DP5(iii)): C

Question 12 (DP6(i)): D

Question 13 (DP6(ii)): B

Question 14 (DP6(iii)): D

Question 15 (DP6(iv)): C

Question 16 (DP7(i)): C

Question 17 (DP7(ii)): A

Question 18 (DP7(iii)): A

Question 19 (DP7(iv)): C

Question 20 (DP7(iv)): B

Question 21 (DP8(i)):C

Question 22 (DP8(ii)): A

Question 23 (DP8(ii)): B

Question 24 (DP9): A

Question 25 (DP9): D

Solution Pathway

Section 2: Short Answer Questions and Extended Response

Question 1 (DP5(ii))

All types of sound stimuli are processed by the auditory cortex, located in the temporal lobe of the brain.

2 marks

Question 2 (DP7(iii))

i. The corpus callosum.

1 mark

ii. **How:** Vithiya would be unable to name the object on the left side of the screen. (1 mark)

Why: The severing of the corpus callosum means that the information sent to the right hemisphere of her brain (from the left side of the screen) is no longer able to be relayed back to the left hemisphere where the language centre is located in order for the object to be verbally identified. (2 marks)

3 marks

Question 3 (DP4 (i))

i. Electrical conductivity of the skin's surface.

or

Resistance of the skin's surface to the passage of electricity.

1 mark

ii. An EEG detects, records and amplifies electrical activity of the brain in the form of brain-waves. (1 mark)

Beta waves would be shown by a person in an alert state. (1 mark)

2 marks

Question 4 (DP5(i))

Psychological effects

Any **two** of the following:

- anxiety
- phobias
- irritability
- mood swings
- hallucinations
- delusions
- difficulty concentrating, paying attention
- more difficulty solving simple tasks than complex tasks.

2 marks

Physiological effects

Any **two** of the following:

- shaking hands
- feelings of fatigue
- drooping eyelids
- problems focusing eyes
- heightened sensitivity to pain
- decreased physical strength
- REM rebound
- dizziness
- headaches

2 marks

Solution Pathway

Question 5 (DP6(iv))

- i. The reticular activating system (RAS) is a network of neurons extending in many directions from the reticular formation to different parts of the brain and to the spinal cord. (1 mark)
- ii. Its main function is to regulate levels of arousal in areas of the cerebral cortex. (1 mark)
When something happens that demands attention, the RAS will send an increased number of neural messages to arouse specific cortical areas. The RAS has the ability to focus on the most important neural information, directing attention towards potentially significant events. In doing so, it influences what we attend to – selective attention. (2 marks)

4 marks

Question 6 (DP2)

- i. An altered state of consciousness either makes our senses more receptive to external stimuli, or dulls them to such an extent that some sensations are not experienced at all. For example, hallucinogenic drugs such as LSD, may cause heightened perception of colours, sounds, touch and other sensory experiences. A drug such as alcohol may dull sensations by slowing down the nervous system so that sensory input fails to be perceived at all. The sensation of pain may not be experienced whilst intoxicated, although the stimulus is still damaging the person's body. Even the person's perception of their own identity can be disrupted and in extreme cases, they may feel that they are outside their own body or that they are someone else.

1 mark: for acknowledging that perception may be heightened or dulled.

2 marks: 1 mark for each example (up to two) relevant to such changes in perception.

Cognition is usually impaired during an ASC. Thinking is often more disorganised, illogical and lacking logical sequence. This can be true of either a waking ASC, or the ASC of dreaming during sleep. Difficulties also occur with problem solving, decision making, memory, judging and other cognitive functions. For example, the lowering of inhibitions and fear when intoxicated has resulted in decisions by people to take extraordinary risks – often with extremely harmful or fatal results.

2 marks: 1 mark for describing the general effect of an ASC on cognition and 1 mark for an example.

- ii. Our estimation of the speed at which time passes is often distorted in an ASC. In some ASCs time may appear to pass more quickly, while in other ASCs time appears to pass very slowly. For example, sometimes when we are woken from sleep we are surprised to see that we still have a lot more time before we need to get up. On other occasions when we awaken, we can't believe the whole night has passed and we have to get up for work or school. This distortion is often accompanied by an inappropriate feeling of well being after waking prematurely or still feeling tired despite having had a full night's sleep.

2 marks: 1 mark for the generic description of the distortion to our perception of the rate at which time passes and 1 mark for an example – the example need not involve sleep; any ASC example and the effect of it on the passing of time will suffice.

Solution Pathway

- iii. Emotional awareness may be heightened or dulled too. The expression of emotions that result from this change are often very inappropriate. For example, some people become more emotional when affected by alcohol – the “crying drunk”, the “aggressive drunk”, the “hysterical drunk”. Others however, may be emotionally numbed by an ASC and not respond at all, or have the opposite emotional response to what is socially acceptable; for example laughing at someone’s tragic news, or crying at something normally considered to be humorous.

1 mark: for acknowledging that emotional awareness may be heightened or dulled.

2 marks: 1 mark for each example (up to two) relevant to such changes in emotional awareness and/or emotional expression.

- iv. Self-control is more difficult to maintain in an ASC. This is true both of physical self-control and psychological self-control. For example, self-control of bodily movements is often impaired when in an ASC and we may stumble, bump into things, or even fall. Psychological changes in self-control may be displayed under the ASC of hypnosis for example – we are generally more susceptible in a hypnotic state and our behaviour is likely to be affected by lowered inhibitions. This may result in an embarrassing display of affection towards someone for whom it is inappropriate, such as your friend’s boyfriend.

1 mark: for acknowledging that self-control may be affected physically or psychologically.

2 marks: 1 mark for a physical example and 1 mark for a psychological example.